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(54) Title: A METHOD FOR THE PRODUCTION OF HIV-1 GAG VIRUS-LIKE PARTICLES

(57) Abstract: The invention describes a vector including a nucleotide sequence encoding an HIV Gag polypeptide for use in the production of HIV-1 Gag virus-like particles. The vector may be a plant vector, for example, a tobacco mosaic virus vector such as the pBSG1057 vector or a tobacco etch virus vector. The vector may also be an *Agrobacterium tumefaciens* containing a T-derived plasmid construct. Alternatively, the vector may be an insect vector such as a baculovirus vector. HIV-1 Gag virus-like particles are also described, as is the use of the virus-like particles in a vaccine for use in the treatment or prophylaxis of HIV infection in a mammal, the vaccine including virus-like particles of proteins or polypeptides substantially as described above.

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INTERNATIONAL SEARCH REPORT

International Application No.

PCT/IB 03/05634

A. CLASSIFICATION OF SUBJECT MATTER

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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C07K C12N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, BIOSIS, Sequence Search

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 02/04494 A (SWANSTROM RONALD IVAR ; UNIV NORTH CAROLINA (US); JOHNSTON ROBERT EDWA) 17 January 2002 (2002-01-17) Seq. ID No. 1 abstract; claim 5	1-27
X	WO 00/39302 A (CHIRON CORP) 6 July 2000 (2000-07-06) abstract; claims 44,47; examples 1A-C,7	1-27
X	WO 02/03917 A (UNIV NORTH CAROLINA ; CALEY IAN (US); DAVIS NANCY (US); KEITH PAULA (U) 17 January 2002 (2002-01-17) page 57, last paragraph; example 5 abstract page 82, paragraph 1	1-27
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	HARMELEN VAN J ET AL: "Characterization of full-length HIV type 1 subtype C sequences from South Africa" AIDS RESEARCH AND HUMAN RETROVIRUSES, MARY ANN LIEBERT, US, vol. 17, no. 16, 1 November 2001 (2001-11-01), pages 1527-1531, XP002248735 ISSN: 0889-2229 Gene bank Acc. No. AY043175 abstract page 1531, left-hand column, paragraph 1 - paragraph 2	1-27
P,X	----- WILLIAMSON CAROLYN ET AL: "Characterization and selection of HIV-1 subtype C isolates for use in vaccine development." AIDS RESEARCH AND HUMAN RETROVIRUSES. FEB 2003, vol. 19, no. 2, February 2003 (2003-02), pages 133-144, XP009034311 ISSN: 0889-2229 Gene bank Acc. No. AY043175 abstract	1-27
P,X	----- WO 03/004620 A (CHIRON CORP ; LIAN YING (US); BARNETT SUSAN W (US); ZUR MEGEDE JAN (US) 16 January 2003 (2003-01-16) Seq. ID No. 99 page 56, line 5 - page 57, line 5; claims 1,27,40 -----	1-27

INTERNATIONAL SEARCH REPORT

Int. Application No
PCT/IB 03/05634

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 0204494	A	17-01-2002	AU 7331301 A	21-01-2002
			AU 7864101 A	21-01-2002
			EP 1309617 A2	14-05-2003
			WO 0204494 A2	17-01-2002
			WO 0203917 A2	17-01-2002
			US 2002141975 A1	03-10-2002
			US 2004116660 A1	17-06-2004
WO 0039302	A	06-07-2000	AU 2221600 A	31-07-2000
			AU 2487300 A	31-07-2000
			AU 2596600 A	31-07-2000
			CA 2358385 A1	06-07-2000
			CA 2358915 A1	06-07-2000
			CA 2360347 A1	06-07-2000
			EP 1433851 A2	30-06-2004
			EP 1141313 A2	10-10-2001
			EP 1141314 A2	10-10-2001
			EP 1141315 A2	10-10-2001
			JP 2002533124 T	08-10-2002
			JP 2002533125 T	08-10-2002
			JP 2003523721 T	12-08-2003
			WO 0039302 A2	06-07-2000
			WO 0039303 A2	06-07-2000
			WO 0039304 A2	06-07-2000
			US 2003223964 A1	04-12-2003
			US 6602705 B1	05-08-2003
			US 2002146683 A1	10-10-2002
			ZA 200105589 A	06-08-2002
			ZA 200105590 A	16-05-2002
WO 0203917	A	17-01-2002	AU 7331301 A	21-01-2002
			AU 7864101 A	21-01-2002
			EP 1309617 A2	14-05-2003
			WO 0204494 A2	17-01-2002
			WO 0203917 A2	17-01-2002
			US 2002141975 A1	03-10-2002
WO 03004620	A	16-01-2003	CA 2452015 A1	16-01-2003
			CA 2452119 A1	16-01-2003
			EP 1411770 A2	28-04-2004
			EP 1409694 A1	21-04-2004
			WO 03004620 A2	16-01-2003
			WO 03004657 A1	16-01-2003
			US 2003198621 A1	23-10-2003
			US 2003143248 A1	31-07-2003
			CA 2458995 A1	13-03-2003
			EP 1427806 A2	16-06-2004
			WO 03020876 A2	13-03-2003
			US 2003194800 A1	16-10-2003
			US 2003170614 A1	11-09-2003